

## APPENDIX C

This appendix is a stormwater management guideline for private development activities which require permits for construction and certification within the City of Savannah. Applicants of private development projects are required to submit a stormwater management plan in compliance with city, state, and federal ordinances/regulations. If an existing ordinance conflicts with this attachment, the ordinance shall apply. This manual references specific methodologies. If other methodologies are used, the calculations will be reviewed but the City reserves the right to request that specified methodologies are used to perform stormwater calculations.

### 1.1 Information Sources

Reliable and complete information is vital for effective planning and design. The basic inventory requirements are, but are not limited to the following:

1. **Location Maps:** These maps are used to locate major watercourses, political subdivisions and existing or planned topographic features and improvements.
2. **Topographic Maps:** These maps detail ground elevation contours.
3. **Soil Survey and Soil Maps:** These maps provide information about infiltration and runoff processes in the basin. Existing and future data concerning soil, land use and cover types must be known before runoff flow rates and volumes can be calculated. High groundwater elevations must be known before stormwater system designs are finalized.
4. **Stream/Canal Survey:** Preliminary stream surveys may be developed from topographic maps. Field surveys should be performed to verify elevations and topography prior to final design and construction.
5. **Site Survey:** This information will reflect the existing features of the land under proposed development. This shall include plan view drainage as well as topographical/elevations contours shown for mean sea level.
6. **Tidal Information:** The elevation of the highest high tide for outfall design should be provided.
7. **Special Flood Zone Information:** National Flood Insurance Program maps will be used to determine such items as the minimum finish floor elevation, criteria in design/construction practices, flood mitigation volumes, etc.
8. **Historic Runoff Routes:** The designer needs to take care not to adversely alter historic runoff routes and stormwater flow directions.
9. **Existing Urban Developments:** Features such as land use, transportation, and water bodies should be indicated on maps.
10. **Future Developments:** Updates of overall management goals, land use patterns, and re-developments should be considered.
11. **Rainfall:** The rainfall amount and distribution determines the development of appropriate stormwater controls.

12. **Environmental Site Assessment:** Complete report of ESA for the proposed development is required as necessary.

## **1.2 Controlling Runoff from Commercial and Residential Areas**

When developing a commercial or residential area, the primary purpose of stormwater management is to prevent the new development from adversely impacting property owners both upstream and downstream of the new development. Stormwater facilities used to include: detention and retention basins, infiltration trenches and basins, porous pavement, flood mitigation areas, and other means of limiting stormwater runoff. These facilities are used as controls in several areas, such as:

1. **Peak Discharge Control:** Stormwater facilities can be used to control peak discharges, the maximum instantaneous rate of flow during a storm. A design storm event can be used to determine the flow rate.
2. **Quantity Control:** Stormwater facilities can be used to retain the increase of stormwater runoff volume resulting from development.
3. **Groundwater Recharge:** Structural controls can be used to divert portions of runoff volume back into the soil where enhancement, or artificial recharge of groundwater, is simulated. Given Savannah's rain patterns and high groundwater table, this method is rarely acceptable and used only as a last resort, even in the presence of the most porous of soils.
4. **Stream Bank Erosion Control:** may be used to protect stream banks. Measures that control peak discharges (such as retention basins) can provide some degree of stream bank erosion control.

As development occurs, changes to the topography of the land can cause changes in the runoff patterns and in the volume of runoff produced. A range of controls are available to modify the quantity and quality of stormwater runoff. These controls include physical measures to redirect or store stormwater and non-structural measures to treat runoff patterns stormwater runoff.

## **1.3 Physical/Structural Controls**

Physical or structural controls are facilities used to contain or divert runoff. Typical structural controls are:

1. **Detention Basins:** A detention basin is a pond, underground vault, or pipe system that temporarily stores stormwater. Detention basins store the additional stormwater runoff created by development and discharge stormwater at the desired rate. The operational characteristics of a detention system are dependent upon the volume of the detention pond, the type and size of the outlet device. These systems shall be designed to provide at least one foot of vertical detention storage volume for runoff above the proposed

dry weather water level design elevation if possible. City stormwater drainage canals, public thoroughfares, and public infrastructures shall not be used for storage.

2. **Retention Basins:** Retention basins are designed for the long term storage and infiltration of stormwater runoff. These basins can also be constructed with outlet structures that discharge to downstream areas similar to those of detention basins. Because of the limitation on discharge, the capacity of retention area to store stormwater is totally dependent upon the size and the natural processes of evaporation and infiltration. These basins are used frequently in larger residential and/or commercial developments.
3. **Infiltration Trenches:** There are several techniques for trench design. In general, these controls function by diverting runoff into a shallow (3 to 8 ft. deep) excavated trench backfilled with stone. The trench serves as a reservoir. Given Savannah's rain pattern and high groundwater table, this method is rarely acceptable.
4. **Infiltration Basins:** These basins are developed by excavating or constructing an impoundment for runoff storage. Infiltration basins are used where soils are very permeable to promote infiltration. Given Savannah's rain pattern and high groundwater table, this method is rarely acceptable.

#### **1.4 Sediment Control Ordinances**

Soil erosion from runoff can cause severe property damage. High stream velocities and water volumes can erode banks and undermine tree root systems. Uncontrolled runoff can also cause erosion around culverts, which can damage roads and utilities. Sedimentation is a by-product of erosion that results from unprotected land washing away in storm runoff. To prevent erosion and sedimentation problems, precautions can be taken before new construction is started and then continued until a project is completed and vegetation is re-established.

Erosion or sediment control plans shall comply with the latest version of Georgia's Soil and Erosion and Sedimentation Control and the City of Savannah's Soil Erosion and Sedimentation Control Ordinance (Part 8, Chapter 6; see Appendix D) for new construction projects and land disturbing activities. Source controls include, but are not limited to, silt fence, stream diversions, ground cover, lined channels, and sediment basins.

#### **1.5 Managing Flood Plains and Flood Control**

Flood control management programs include structural controls, emergency preventative measures, loss alleviation measures, and flood plain land use management. The City of Savannah has several requirements for development in the flood plain. Some of the typical flood control requirements as they relate to private development are listed below.

1. Physical structures such as dams, reservoirs, levees, pump stations, channel improvements, and detention/retention ponds.

2. For development activities in the Flood Planning Areas as defined by the FEMA/NFIP maps, shall not cause an increase in the elevation of the 100-year flood.
3. For single site plan development, the flood zone boundary(s) shall be shown and identified on plan. For subdivisions, the flood zone boundary (s) shall be shown and identified on the plat. In both subdivision and site plan development, the flood zone boundaries shall be derived from the latest FEMA maps. In the case of unnumbered A and V zones it shall be the responsibility of the developer's engineer to determine the elevation of the 100-year flood plain, subject to the City's acceptance.
4. The finished floor elevation of all structures located within the Flood Plain shall be equal to FEMA and FIRM 100-year flood elevation as determined by maps, or an elevation determined by a Professional Engineer, registered in the State of Georgia, and approved by the Stormwater Management Director for the City of Savannah.
5. For Special Flood Hazard Areas with no base flood elevation determination, the property owner is required to have the 100-year flood elevation determined by a registered Professional Engineer in Georgia.
6. Finished floor elevations for structures not included in the SFHA shall be determined by one of the following methods:
  - A. as shown on the original subdivision plat,
  - B. as shown on the neighborhood grading and drainage plan, or
  - C. as determined by a registered Georgia Professional Engineer and approved by the Stormwater Management Director.
7. For V zones, the 100-year flood elevation shall come from the FEMA/FIRM maps.
8. Any fill material placed inside a floodway, below the base flood elevation shall be mitigated on site or an adjacent site by an equal volume of excavated material. The mitigation excavation must be hydraulically connected to the floodway at an elevation less than or equal to 2 feet below the 100-year flood plain elevation.
9. Compliance with the City of Savannah's Flood Damage Protection Ordinance, Part 8, Chapter 7; see Appendix E).

## **1.6 Maintaining Stormwater Facilities**

The importance of maintenance cannot be over emphasized. Without maintenance, facilities will deteriorate and function improperly and in some cases, may even pose a hazard. Stormwater systems can be easily overloaded as urbanization occurs. As development occurs in a small watershed, the quantity of sediment washed into streams and lakes increases and requires removal. Other types of maintenance, such as fence and dam repair, debris and vegetation removal may also be necessary. The present and long-term effectiveness of stormwater management system depends on how often and efficiently maintenance is performed.

Design of all stormwater management systems must be done with future ease of maintenance in mind, including access and maintenance. The developer is responsible for maintaining the stormwater management system during the development of the site. The site plan should have provisions for stormwater management system maintenance. If the stormwater management system will be maintained by the City when the development is completed, then maintenance and access easements and/or Right-of-Way must be provided and recorded on the property plat.

The maintenance program must be developed and submitted for acceptance with the drainage report. For the life of any stormwater management facility, the maintenance evaluation must include:

1. Description of required maintenance.
2. Maintenance schedule and record keeping of operations.
3. Design requirements (access, clean-out traps, etc.).
4. Maintenance responsibility after project completion.
5. Periodic inspection, adjustments and replacements.
6. Cost accounting.
7. Annual (or more frequent) review of the cost effectiveness of the preventive maintenance program.
8. On-site litter control.

A good maintenance program should include preventive maintenance as well as corrective maintenance. A preventive maintenance program must have an assured source of funds, or it will be impossible to schedule maintenance as needed. Corrective maintenance can be crisis oriented and the direct result of insufficient maintenance and problems that go unrecognized or are unattended over a lengthy period of time. This type of maintenance is often done in an emergency situation and is not the most effective or economical means of maintenance.

### **1.7 Wetlands Protection**

Wetlands are areas that are saturated by water for varying periods of time throughout the growing season. The presence of water promotes the growth of specially adapted vegetation. Wetlands include swamps, bogs, marshes, and drainage ditches.

All wetlands issues shall be addressed in accordance with U. S. Corps of Army Engineers policies.

The protection of wetlands depends heavily upon a clear understanding of the wetland environment. Stormwater management can be accomplished while respecting the wetland environment through such practices as:

1. Flow routing

2. Water level maintenance
3. Inflow/Outflow regulations
4. Seasonal application of storm waters
5. Routing waters to areas of high soil permeability for maximum infiltration
6. Debris removal systems

### **1.8 Canal/Ditch Bank Protection**

Creek restoration and stream bank protection measures have been used to manage stormwater and erosion for many years. However, many obstacles prevent successful management. Heavy equipment requirements and costly construction materials affect the suitability of various methods. Additionally, some stormwater/erosion control management methodologies may significantly alter the channel. Should any alteration of a channel occur in either the design or construction process, it is the responsibility and obligation of the design engineer to ensure the alteration will not increase flood elevations.

The U. S. Army Corps of Engineers advocates several bank protection methods. Some of these methods are listed below:

1. **Bed Scour Control:** Check dams and lining material can be used to reduce or eliminate streambed scouring.
2. **Vegetation:** This is one of the most commonly used methods because it is easy to establish and maintain and is aesthetically pleasing. Grasses and woody plants are the main types of vegetation used.
3. **Bank Shaping:** Banks may need to be shaped to prevent rough zones that encourage eddy currents which can severely erode a bank.
4. **Surface Sod Stabilizers:** Depending on vegetation and soil conditions 3 common stabilizers used are:
  - A. Sand-cement blankets
  - B. Clay-lime-cement blankets
  - C. Mulches
5. **Rip-Rap:** Stone rip-rap can be placed on a stream bank to prevent erosion. The use of filter fabric as an underlayment will aid in erosion control.
6. **Rubble:** This method is favored when minimal funds are available. Rubble can be placed on an eroding bank. It is important to select the appropriate material, such as bricks or broken pavement, to ensure that the rubble is heavy enough to stay in place during heavy flows.
7. **Gabions and Wire Mattresses:** These wire-mesh baskets can be filled with stone and used where existing material is not large enough to stay in place during high flows.
8. **Sandbags:** Burlap sacks filled with soil and sand-cement mixtures can protect stream banks.
9. **Blocks:** Pre-cast cellular blocks provide drainage and allow vegetation growth, permitting root growth for bank stabilization.
10. **Fences:** Fence construction parallel to a bank line can reduce stream

- velocity, encourage sediment deposition, and develop new or maintain existing bank alignment.
11. **Bulkheads:** These can be used to prevent erosion or stream bank failure. Bulkheads provide an increase in waterfront area and improve both water and land access. Bulkheads may be constructed from such materials as, but are not limited to concrete, steel, timber, and aluminum with varying degrees of expense.
  12. **Dikes:** Dikes can reduce the stream velocity (permeable dike) and deflect current away from the bank (impermeable dike).

## **2.1 General Standards for Stormwater Management Plan Design**

Development shall include adequate provisions for stormwater in compliance with the City of Savannah's Stormwater Ordinance (Part 8, Chapter 11; see Appendix F), the City of Savannah's Subdivision Regulations (Part 8, Chapter 2; see Appendix G) as well as the drainage standards contained in this document. If appropriate, the hydrologic requirements for proposed development sites shall be determined in accordance with the U. S. Department of Agriculture, Soil Conservation Services (SCS) Technical Release No., 55, entitled Urban Hydrology for Small Watersheds and SCS National Engineering Handbook, Section 4, entitled Hydrology. The rational method may be used for areas less than ten acres. Other methods may be used when accepted by both the City Engineer and the Stormwater Management Director in writing. A pre-design conference with the City Engineer and the Stormwater Management Director is suggested on large projects.

The following standards shall pertain to all stormwater management plans:

1. Each development shall comply with stormwater design standards to maintain pre-development peak discharge rates for the 2,5,10, 25-year, 24-hour storm. On site detention/retention shall be used with the developer required to provide storage for the 2, 5, 10, 25-year, 24-hour storm at the respective pre-developed 2, 5, 10, 25-year, 24-hour release rate. Detention requirements might be waived for relatively small developments with direct discharge into large tidal water bodies.
2. No development shall be permitted that can be shown to increase the flood potential within the development, or on adjacent lands.
3. All drainage plans and calculations shall be prepared by a professional engineer, licensed in the State of Georgia with accompanying seal, signature, and date.
4. Surface runoff calculations shall be computed for the entire drainage area of the basin, which may extend off site. The computation of surface runoff shall utilize one of the accepted methodologies.
5. The finished floor elevations shall be submitted for all structures development. For subdivision plans a neighborhood grading and drainage plan shall also be submitted.

## **2.2 Drainage Design Standards, Methodologies and Criteria**

1. The Rational Method:
  - A. 0 - 10 Acre Tracts: Will include consideration of existing conditions surrounding the tract to be developed if contributory to or impacted by the development.
  - B. 11 - 200 Acre Tracts: Will include the hydrologic and hydraulic features within the total watershed and impacted upstream and downstream areas.
  - C. A comparative analysis may be required when the tract size exceeds 50 acres using SCS TR-55.
  - D. The developer's engineer shall show all assumptions and provide sample calculations.
2. The U.S.D.A. S.C.S. T.R. - 55 (Urban Hydrology for Small Watersheds) and the U.S.D.A. S.C.S. N.E.H. Section 4 (Hydrology)
  - A. This methodology may be used for tracts with watershed acreage of 1-200 acres and must be used on watershed areas exceeding 200 acres.
  - B. S.C.S.-T.R. 55 Method: The minimum CN used shall be 39 with a Class A soil characteristic.
3. The following design criteria shall be used for any methodology chosen for computation:
  - A. A breakdown of both pre and post watersheds must be shown.
  - B. Impacts of the following:
    - (1) Site inflows in C.F.S. and Hydrograph(s)
    - (2) Site outflows in C.F.S. and Hydrograph(s)
    - (3) Backwater effects
    - (4) Soil characteristics
    - (5) Peak water levels for the 2, 5, 10, and 25-year, 24-hour storms.
    - (6) Peak water levels shall be checked relative to a 100 year storm frequency in setting first floor elevations as defined by the FEMA/FIRM maps.
    - (7) Pre-development conditions shall be carefully evaluated as to adequacy of drainage design (if any), and removed, replaced, or reworked, if found unsatisfactory.
    - (8) 100-year flood plain analysis as required.
4. Detention (dry or wet) utilizes on site areas where the developer will bear the total cost of such improvements, show there are no adverse effects upstream or downstream, and obtain the acceptance of the Stormwater Management Director. The developer shall ensure that the 25-year, 24-hour storm will not back into a detention facility from outside sources.
5. CN numbers shall not be less than the minimums established in the latest SCS National Engineering Handbook, Section 4, Hydrology and shall be in all cases acceptable to the Stormwater Management Director.
6. The peak value of the discharge hydrograph or runoff calculations for the developed or redeveloped site shall not exceed, in terms of peak flow, the peak

value of the discharge hydrograph or runoff calculations of conditions existing prior to development or redevelopment of the 2, 5, 10, and 25-year storm of twenty-four hour duration. The Engineer is required to submit stormwater runoff calculations.

7. Retention and detention ponds may be used to retain and detain the increased and accelerated runoff which the development generates. Water shall be released from detention ponds into drainage ways, channels, or lagoons at a rate, in terms of peak flow, not exceeding pre-development conditions for the 2, 5, 10 and 25-year storm of 24-hour duration. The purpose of limiting the discharge rate is to prevent exceeding the capacity of downstream drainage facilities as well as preventing any additional upstream flooding. The design engineer is required to submit stormwater runoff and storage calculations.
8. Use of permeable surface materials (excluding all areas which require "dustless" surface) which will allow for the percolation of rain falling on that surface is permissible in order to reduce runoff volumes.
9. Detention and retention ponds shall be designed to provide at least one (1) foot of vertical detention storage volume for runoff above the proposed dry weather water level design elevation where possible. Drainage canals shall not be used for storage. Use of trapezoid/rectangular weir outlets will be allowed for given situations. Use of orifice plates will be allowed provided such plate is securely fastened to a given structure. Minimum size is encouraged to be 6" in diameter. V-shaped or V-notched weir outlets are recommended to achieve detention storage. Use of innovative outlet structures will be evaluated. Design data for storage volume and detention outlet requirements shall be submitted to and accepted by the Stormwater Management Director or his designee prior to final plan acceptance. Any portion of a proposed detention system shall not be part of the City's stormwater drainage system. The maximum depth of parking lot storage is 6" above pavement. If additional depth is required, a letter from the property owner will be required in order to ensure his/her knowledge.
10. Where cleared site conditions exist around detention or retention areas, the banks shall be sloped to the proposed dry weather surface elevation and planted for stabilization purposes. Where slopes are not practical or steep slope encountered by site plan requirement, other methods of bank stabilization will be used and noted on plans submitted for acceptance.
11. For direct stormwater discharges:
  - A. Channeling of undetained runoff directly into a natural or manmade water body from pipes, curbs, lined channels, hoses, impervious surfaces, rooftops, or similar methods shall generally not be allowed unless specifically cited as being allowed.
  - B. Where site consideration allows direct discharge into a natural water body, the elevation of the detention outfall must be higher than that of the elevation of the highest high tide. Methods of diffusing and filtering the discharge and of reducing the velocity will be required as accepted by the Stormwater Management Director.

- C. Discharging collected stormwater from inverted crown streets, roadways and parking areas directly into man-made water bodies is discouraged because of its adverse impact on water quality. Use of crowned streets, roadways and parking areas which allow opportunities for perimeter and sub-surface infiltration and for sheet flow through vegetation, grass, gravel, sand or other filter mediums is strongly encouraged. Where direct discharges from inverted crown paved surfaces into man-made water bodies are proposed, the use of skimming devices, oil and grease traps, or other filtration methods or techniques accepted by the Stormwater Management Director will be acceptable.
12. Dredging, clearing, deepening, widening, straightening, stabilizing or otherwise altering natural or man-made water bodies may be permitted by the Stormwater Management Director only when a positive benefit can be demonstrated. Such acceptance by the City Engineer and Stormwater Management Director does not obviate the need for State or Federal agency approvals where applicable.
  13. No development will be permitted to construct, establish, maintain, or permanently alter the surface water elevation of any water body or wetland that will adversely affect the natural drainage from any upstream or to any downstream areas of the drainage basin.
  14. The City Engineer and Stormwater Management Director may accept the water surface elevations proposed for lagoons or water bodies. The developer will submit sufficient ground water, topographic elevation, and hydrologic data on or around the proposed water body site to assist in establishing the water surface elevation.
  15. Channel and pipe flow velocities shall be maintained at a level which minimizes erosion and sediment transport wherever and whenever possible. This level is generally two feet per second for unimproved sandy soils.
  16. Final landscape designs and plantings shall not interfere with the stormwater runoff controls and drainage systems. Landscape design and plantings shall provide further opportunities for percolation, retention, detention, filtration and plant absorption of site-generated stormwater runoff.
  17. A report shall be submitted which shall include, but not limited to, all items as required as well as a narrative of explanation. Such narrative will explain all the assumptions used, conclusions, methodologies, definition of all variable derivation, etc. The report shall be performed by a Georgia registered professional engineer and shall bear the seal, signature, and date.
  18. In order to establish existing site condition such as, parking, building, etc., the developer shall provide engineering/architectural, survey for verification. The site survey, engineering/architectural drawings shall be dated no more than five years from date of application submitted for site review and acceptance. Any drawings (engineering or architectural), which are dated more than five or more years will be considered on the case by case basis.
  19. No stormwater discharge, detained or undetained, is allowed into the adjacent private property with the following requirements:

- A. A written acknowledgement from adjacent private property owner(s). Said acknowledgement shall contain acceptance of developer's plans as well as proposed and existing drainage conditions.
- B. The adjacent private property drainage system shall meet the requirements of City of Savannah's ordinances.
- C. The developer shall acquire any and all necessary drainage easements for the discharge of stormwater through the affected adjacent property. Said easement shall not be for the City, but for the developer.

### **2.3 Drainage Easements**

- 1. The City shall require as a condition for obtaining acceptance of runoff control and drainage plans that the applicant record plats, deed restrictions, and/or covenants insuring that drainage easements and facilities are assigned to a specific entity. Specific entities may include, but are not limited to, the developer, the owner of property, a Homeowner's or Landowner's Association or regime, or to the City of Savannah. If the recording of such covenants or plats is not desired by the applicant, the City Engineer and Stormwater Management Director will then require as it deems necessary that the applicant solicit dedication to and acceptance by a specific entity of such easements and facilities to assure the provision, maintenance and operations of said facilities. All easement and/or covenants shall be recorded and filed in the Chatham County Courthouse.
- 2. The maintenance requirements necessary to insure the long-term functions of deeded stormwater runoff controls, easements and drainage facilities shall also be described in the documents establishing the Homeowner's or Landowner's Association. The documents will also state that the City or a legal entity having authority over such drainage may perform or require the Homeowner's or Landowner's Association to take action in the event that the Homeowner's or Landowner's Association do not meet the obligation of the maintenance requirement, the City or a legal entity reserves the right to access and perform:
  - A. Normal maintenance which will result in the resumption of normal drainage flow.
  - B. Activities which alleviate flooding or other emergency drainage problems upstream or downstream of the easement.
- 3. Minimum Right-of-Way and Easement widths for stormwater ditches, swales, canals, etc. shall be determined as follows:
  - A. For ditches 1-5 ft, the easement/right-of-way width shall be 20-ft. plus top width of the ditch. The 20-ft. access maintenance shall be provided on one side of the ditch within the easement//R-O-W.
  - B. For ditches 5-25 ft., the easement/right-of-way width shall be 10-ft on one side and 20-ft on the other side of the ditch plus the top width of the ditch.
  - C. For ditches greater than 25-ft., the easement/right-of-way width shall be 20-ft. on both sides of the ditch plus top width.

4. Minimum Right-of-Way and Easement widths for underground stormwater sewers shall be determined as follows:
  - A. For pipe depths 5.0 feet and less from pipe invert to proposed finished grade, the easement or right-of-way width is to be 20 feet.
  - B. For pipe depths between 5.1 feet and 10.0 feet from pipe invert to proposed finished grade, the easement or right-of-way is to be 25 feet.
  - C. For pipe depths 10.1 feet and greater from pipe invert to proposed finished grade, the easement width is to be 30 feet.
5. Drainage easements may be used for other easements with the written approval of the City Engineer and Stormwater Management Director and with consent of the easement holders. Nothing shall be constructed which prohibits the use of drainage easements for access to various properties and other compatible uses without the written authorization of the Stormwater Management Director and City Engineer.
6. All stormwater drainage easements shall be recorded in the Chatham County Courthouse and two (2) copies shall be submitted to the City Engineer and one (1) copy to the Stormwater Management Director. Copies shall be chronoflex mylar.
7. A developer may be required to provide adequate easements downstream from his proposed discharge if adequate public or private facilities do not exist to carry the proposed discharge.

## **2.4 Stormwater Drainage Planning and Submission**

1. Prior to submission of an application, the applicant may meet with the City Engineer and Stormwater Management Director to determine applicable methodology, existing known drainage conditions, and where existing known drainage problems exist. Cooperative methods shall be sought to resolve deficiencies without adversely affecting the applicant.
2. All applicants for plan acceptance shall submit a site plan at an appropriate scale of all site areas to be covered by impervious surfaces and calculations of pipe, channel, swale and detention basin sizing.
3. Shall bear the seal and signature of a registered Georgia Professional Engineer.

## **2.5 Erosion and Sedimentation Control Planning, Submission and Compliance**

New construction is a primary source of sedimentation. To decrease problems associated with sedimentation, a sedimentation and erosion control plan must be developed prior to project acceptance. Several practices which may satisfy the sedimentation and erosion control requirements can be incorporated to stop or limit sedimentation from occurring during construction.

1. **Applicants:** Erosion and sedimentation controls shall be required on all sites. The applicant will identify erosion and sediment control measures between the disturbed areas and adjacent water bodies or drainage ways on plans submitted for plan acceptance.
2. **General:** Shall comply with the most recent State of Georgia Soil Erosion and Sedimentation Control law and all City of Savannah ordinances. Should a conflict arise, the more restrictive case shall apply.
3. **Existing Uncovered Areas:**
  - A. Any site which has been substantial denuded of vegetation, and which is not in active phase of development for more than thirty (30) days, shall have functioning erosion and sediment control measures in place and shall be seeded or planted with an acceptable ground cover material.
  - B. The City will serve upon any landowner, written notice to comply with provisions of this article. The notice will reference the requirements of this article, will set forth the measures needed to comply, and will state a time within which such measures must be completed.  
In determining the measures required and the time allowed for compliance, the City shall take into consideration the economic feasibility, technology and quantity of work required, and shall set reasonable and attainable time limits for compliance.
  - C. The City Engineer and Stormwater Management Director shall have the authority to require preparation and acceptance of an erosion and sedimentation control plan in any instance where extensive control measure are needed as a result of proposed development plans near water courses or water bodies.
  - D. Plans shall bear the seal, signature, and date of a registered Georgia Professional Engineer.
4. **Ground Cover Requirements:** To help retain sediment generated by land disturbing development activities within the boundaries of the development tract, all developers shall plant or otherwise provide a permanent ground cover by "hydro mulching" sufficient to restrain erosion after the completion of the construction of development.